

GeoExchange - A New Experience

Presented by:

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D11 Introduced to GeoExchange

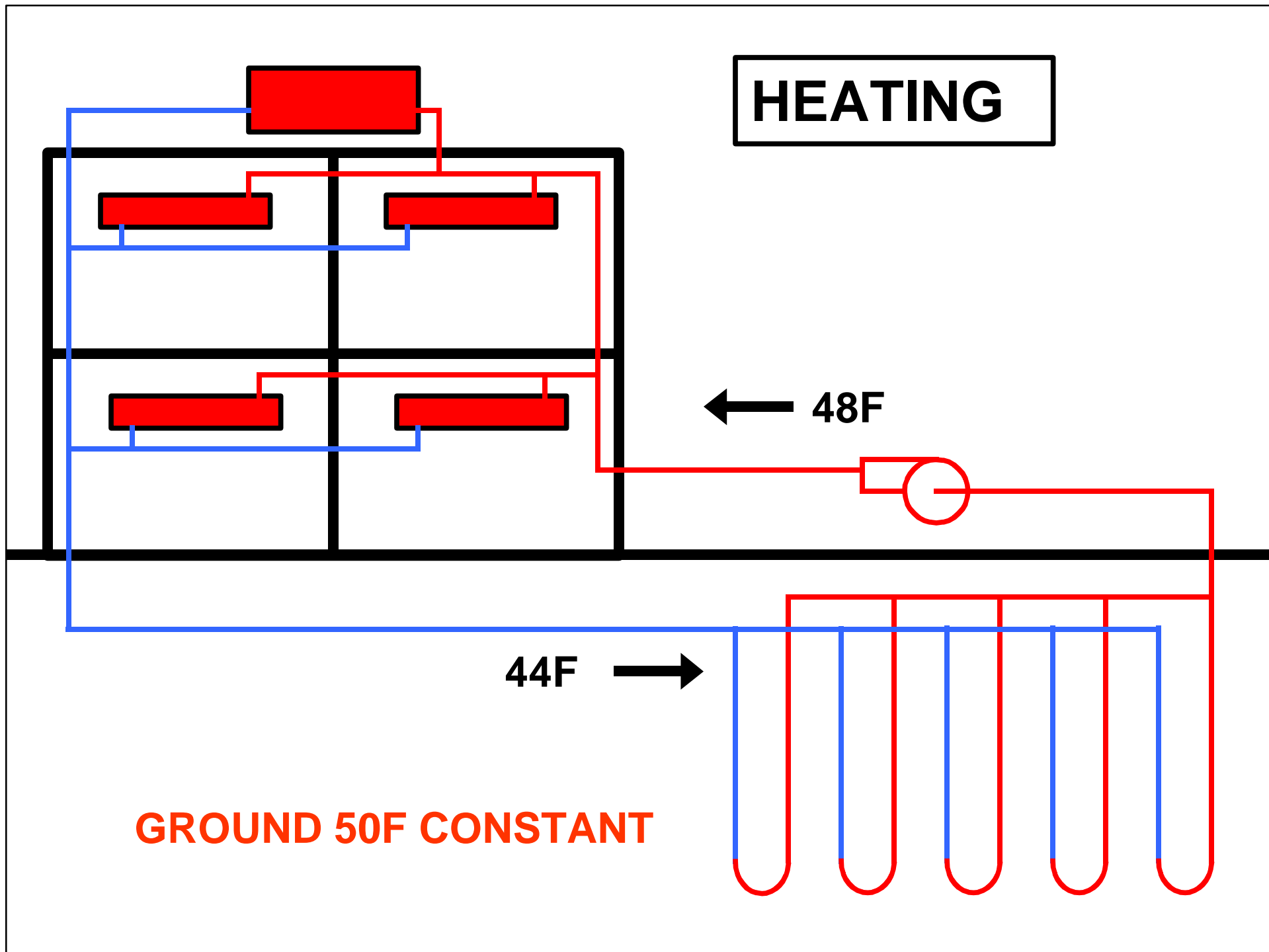
- In 1998 Colorado Springs Utilities introduced D11 to concept of GeoExchange through a teleconference by the GeoThermal Heat Pump Consortium.

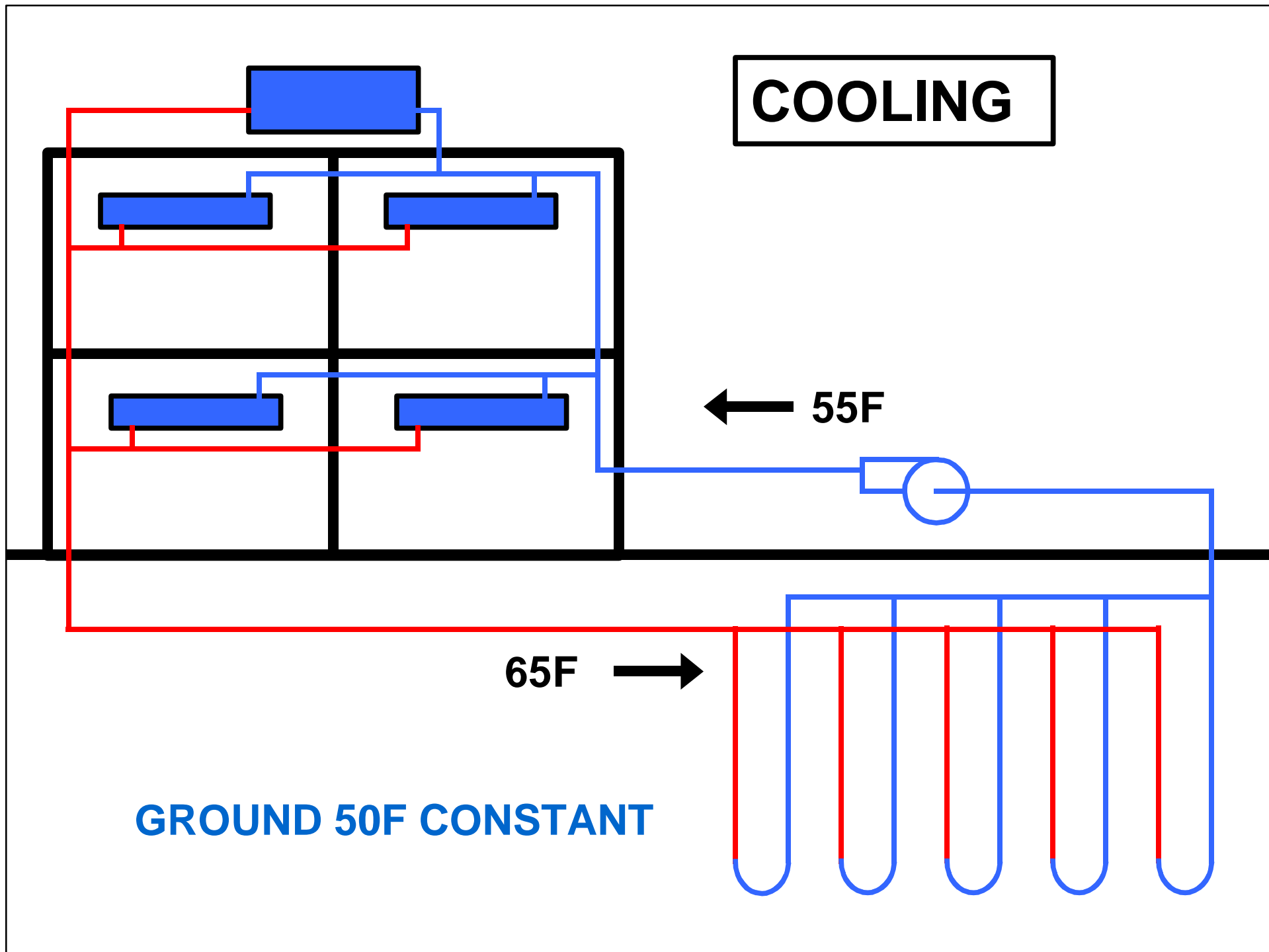
DOE & EPA Promotes Advantages of GeoExchange

- 50% lower operating costs.
- 30% lower maintenance costs.
- Simpler - no boiler, chiller or cooling tower.
- Moves heat to where it's needed.
- Environmentally responsible.

Department of Energy Promotes Advantages of GeoExchange

- Long reliable life - equipment indoors.
- Space saving.
- Easy to retrofit existing buildings.
- Better control opportunities, small zones.
- Zero local emissions.





GeoExchange - The Industry's Best Kept Secret?

- District 11 does more research.
- Proven technology, but not widely accepted.
- 1200 + schools already enjoy the advantages of GeoExchange.

So Why Isn't Everyone Using It?

- Not aware of the technology.
- The word “HEATPUMP” traditionally means “TROUBLE”.
- Most HVAC designers are skeptical of GeoExchange and discourage their clients from considering it.

D11 Selects a Pilot Site

- New FOTC building selected as a pilot.
- 26,000SF.
- 72 Tons heating/cooling.
- Closed loop vertical field - 9600LF of bore (32x300ft).
- 32 Ground source heat-pumps.

Feasibility Study

- D11 gets DOE feasibility study grant.
- GHPC helps to sell concept to D11 leadership.

1998 Feasibility Study

	GeoExchange	Conventional
• First Cost	\$181,897	\$116,480
• Heating Cost	\$7,286	\$12,127
• Cooling Cost	\$5,023	\$8,530
• Energy Cost/SF/YR	\$0.52	\$0.88
• Maintenance	\$2,601	\$5,991
• Total Operating Cost	\$14,911	\$26,648
• 20 Yr. Life Cycle Cost	\$474,198	\$763,946
• Simple payback	5.6 yrs	

DOE Design Assistance Program

- D11 makes a commitment.
- D11 gets DOE design assistance grant.
- D11 selects an approved GeoExchange expert / mentor.

Getting Started

- Resources – DOE / Geothermal Heat Pump Consortium (GHPC).
- Finding proven GeoExchange expertise – GHPC.
- Feasibility Study – DOE / GHPC grant.
- Design Assistance Program – DOE / GHPC grant.

Achieving Project Success

- Finding the right design team.
- Test bore - geology confirmation.
- Finding a qualified installer.
- IGSHPA certification.
- D11 QA staff training.
- Close project supervision.

Current Status

- Trouble free loop startup.
- Some balancing problems.
- Some air noise problems.
- Commissioning in progress.
- Utility provider assistance in energy monitoring.
- Satisfied building occupants.

What Did It Really Costs?

	Actual	1998 Study
•		
● First Cost	\$429,663	\$181,897
● Installed Cost/SF	\$16.36	\$7.69
● Area SF	26,261	23,652
● Electric Rate \$/Kwh	\$0.063	\$0.046
● Annualized Kwh	195,211	267,609
● Annualized Cost	\$12,319	\$12,310
● Energy Cost/SF/YR	\$0.47	\$0.52
● Maintenance	\$2,601	\$2601
● Total Operating Cost	\$14,920	\$14,911

Current Mechanical Installation Costs

	Cost/SF	% Con. Cost
● FOTC	\$20.17	16%
● Elementary	\$15.61	17%
● Middle	\$13.68	13%
● Alternative	\$15.53	18%
● Average	\$16.25	16%

Actual Savings At 2001 Rates

	GeoExchange	Conventional
•		
• Annual Energy Cost	\$12,319	\$21,374
• Maintenance	\$2,601	\$ 9,991
• Total Operating Cost	\$14,920	\$31,365
• Operating Savings	\$16,445	
• Actual Annual Savings	52%	

More Information

- Presentation handouts.
- GeoExchange tours.
- For more information please contact Thomas Fernandez at (719)477-6011 or fernatom@d11.org